THE COMMON AFFECTIONS OF THE COLON, THEIR ORIGIN AND THEIR MANAGEMENT

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A review of 2500 case histories of private patients with digestive troubles living in and around New York City shows approximately the following distribution of the more common affections of the colon:

Constipation	500 cases per thousand
Common anomalies (redundant colon, low cecum) of each	200 cases per thousand
Colonic irritability ("simple colitis" including "mucous colitis" and diverticulosis)	200 cases per thousand

Next in order are:

Colitis gravis (including "ulcerative colitis")	9 cases per thousand
Carcinoma	6 cases per thousand

In other parts of the world or in other types of practice, one would encounter the specific dysenteries in varying degrees of frequency, viz.:

Bacillary dysenteries, epidemic and endemic

Protozoal dysenteries, amebic and flagellate, as well as the chronic non-dysenteric forms of protozoal infestation, and

Tuberculosis.

Until quite recently, the terms constipation and diarrhea were employed to cover almost the whole range of disturbed colonic physiology. No condition was regarded as worthy of serious consideration unless dignified by the presence of an advanced organic lesion. Nowadays, the ever increasing clinical application of the Roentgen method of study has changed all this, and one can follow almost a whole gamut of functional alterations from early irritability to complete colonic decompensation.

ORIGIN AND FREQUENCY OF THE COMMON AFFECTIONS OF THE COLON

The common affections develop as a result either of a congenital anomaly of the colon or of an instability of its autonomic control or from an interplay of both factors. When it is realized that perhaps one-fifth of all patients

harbor a colonic anomaly of some clinical significance, and that a much greater number, if not an actual majority, suffer from instability of the involuntary nervous system, it should not be so surprising that colon complaints are among the most common encountered in practice.

Another reason for this frequency is that the evacuating function of the bowel is under voluntary as well as autonomic control. This opens up the possibility of abuse through vicious habit formation. Bad habits vary from sheer carelessness and neglect in moving the bowels to the most bizarre types of meddlesome interference culminating in the present craze for irrigations. Similarly, the effects on the bowel vary from simple rectal impactions to attacks of acute hemorrhagic colitis. It is extremely doubtful whether there is another system of the body—cardiac, respiratory, urinary, nervous, or what you will—that is so susceptible to damage by improper methods of living and unsound attempts at treatment. Fortunately for all of us, the colon possesses a remarkably high degree of tolerance and a surprising power of recuperation, once it is liberated from injudicious interference.

Owing to lack of space, we shall limit this presentation to a discussion of the first three conditions listed as most common at the beginning of this paper.

Constipation

Constipation may be roughly defined as an impairment in the inherent capacity of the colon to produce formed stools at regular and frequent intervals.

Etiology.—The etiology of constipation is often complex, and may be due to one or more of the following causes:

1. Congenital anomaly.
2. Body habitus.
3. Diet.
4. Psychic and nervous factors.
5. Vicious habit formation.

1. *Congenital anomaly.*—The most important congenital anomaly causing the production of constipation is redundancy of the colon. Over three-quarters of the patients with this malformation suffer from intestinal stasis, often of great severity. One should not imagine that the redundant loops cause actual obstruction, but rather that they furnish the site for the development of localized spasms. A fuller consideration of the redundant colon will be presented in a later section.

2. *Body Habitus.*—There is no longer any question that body habitus exerts a definite influence on gastro-intestinal motility. For example, in sthenic (stocky) individuals, the bowels normally tend to be free, moving spontaneously as often as three times daily. On the other hand, in asthenic (slim) persons, the bowels normally move but once a day, or perhaps less often. This is not to say that visceroptosis is invariably associated with constipation, or that constipation in asthenics can only be relieved by correcting the ptosis, or even that correction of the ptosis alone is invariably followed by relief of the constipation. The fact remains however, that constipation is more common in the asthenic type than in the sthenic; and that abdominal support is always beneficial in ptotic constipated patients.

3. *Diet.*—Irregular eating habits are a common cause of constipation. "No regular stool output without regular food intake" is a safe rule for patients.

A common dietetic error is the consumption of a highly concentrated dry diet. With the exception of an occasional dish of soup or cup of coffee, many persons consume practically no fluids (especially during the winter) from one day's end to another. In such cases, the drinking of water on a fasting stomach in the morning as well as before meals, may be all that is necessary to cure the constipation.

Simple starvation or inordinate food restriction is also a common cause of constipation. In some cases, there is

an actual physical cause preventing the consumption of normal amounts of food, such as an obstruction in the digestive pathway, or a painful lesion which causes fear of eating. In many individuals, however, various articles of diet are progressively eliminated in an awkward attempt to cure the very constipation that is aggravated by the process. Obviously, the remedy for this state of affairs is the early restoration of an enlarged and balanced dietary.

It is a matter of common knowledge that certain individuals habitually omit from their diet those foodstuffs possessing inherent qualities of increasing intestinal peristalsis. Such foods include the vegetables and cereals with cellulose residues which stimulate peristalsis chiefly by mechanical means; the fruits which also act mechanically, as well as by the presence of cathartic sugars, acids and salts; the sugars themselves; and the fats which act both chemically and mechanically.

For some reason that I have never been able to understand, milk is commonly believed to be constipating. In my experience, raw sweet milk seems to have rather a beneficial laxative effect in some mild cases of spastic constipation. It is to be recommended in malnutrition even if associated with constipation, but must be avoided in all forms of frank colitis.

4. *Psychic and Nervous Factors.*—The importance of psychic factors in constipation can hardly be exaggerated. Ever so many people know from experience that they cannot possibly have a bowel movement when nervous or worried, or while actively engaged in the ardent pursuit of their daily occupation. Even mild excitation, such as that associated with travel and change of environment, is a potent cause of constipation in susceptible individuals, as are, of course, the grosser emotions of fright and anxiety.

One of the peculiar facts in connection with constipation is the concern with which some individuals regard their

failure to secure a daily bowel movement. Not only may an occasional omission be perfectly explicable on the basis of some of the causes just mentioned, but it may even be regarded as well within normal limits if it is not associated with physical discomfort or disability. Unfortunately, these apprehensive individuals only too often develop either a vicious bowel habit or an apprehension neurosis or both conditions.

Fatigue may also be considered under the head of nervous factors. A sufficient degree of general bodily rest and relaxation is essential to the proper functioning of all the organs; and the bowels form no exception to the rule. Whether or not the fatigue products of metabolism are actually constipating, it is nevertheless certain that many cases of costiveness are associated with insufficient rest, and particularly with insufficient sleep. This is very often the case with those who work at night.

5. *Vicious Habit Formation.*—Perhaps the greatest perpetuating cause of constipation is vicious habit formation. Much of the trouble is due to early neglect of the bowels. Getting up too late before rushing to school, shop, or office, and later neglecting the call of nature because of preoccupation, laziness, or embarrassment, have frequently been pointed out in this connection. To this should be added the uninviting condition of toilets in the poorer types of schools, shops, farms, and tenements—conditions that demand remedy at the hands of the appropriate social, educational, or administrative authorities.

Once the chain of regular bowel evacuations is broken, once the fecal stasis begins to cause discomfort, it is but a short step for the sufferer to seek artificial methods of relief. He embraces thenceforth either the cathartic or enema habit or both, and his constipation bids fair to remain fixed for life. Physicians, too, have not been without blame in this matter. A prescription for a cathartic, no matter how well fitted to the temporary needs of a patient, may become just as persistently used as any patent medication.

Varieties of Constipation

Although it is necessary to distinguish several different forms of constipation, it should be stressed that pure forms are rare, and that spasm is a common factor in practically every variety of constipation. The following types may be distinguished for purposes of discussion:

1. *Atonic Constipation.*—This is the variety commonly found in asthenic and malnourished individuals. A congenital intestinal atony or hypoplasia is sometimes assumed to exist in these cases. Atonic constipation may also occur as an end result of long-continued abuse of

Figure 1

cathartics and enemas. It may be limited to the proximal colon, particularly in cases of marked spasm of the distal large intestine. (Figs. 1 and 2.)

FIGURE 2

2. *Spastic Constipation.*—This, perhaps the most common variety of the disease, is often associated with the other forms, as was just mentioned. The distal part of the gut is the portion usually involved by the increased tonus, the condition affecting either the entire colon from the hepatic flexure onward, or certain special areas such as the descending colon, the pelvic colon, or the anal sphincter alone. In the last named instance, local lesions may play

an exciting rôle (fissures, ulcers, and hemorrhoids). When spastic constipation is associated with atony of the proximal large intestine, the cecum, ascending colon and transverse colon act as reservoirs for large accumulations of feces which are passed, small portions at a time, beyond the contracted areas. Clinically, this condition may be associated with daily, but quite insufficient evacuations.

The common symptoms of spastic constipation are abdominal cramps, generally localized in the left lower quadrant, often increased by defecation, and still more by catharsis; peristaltic unrest; and the passage of small stools, hard and lumpy in character (marble or sheep-dung stools). Examination of the left lower quadrant often reveals a tight cord corresponding to the iliac colon. The ceco-colon is often distended, gurgling and tender. The anus may feel tight to the examining finger, while inspection of the pelvic colon with the sigmoidoscope often reveals the presence of an irritable condition which may prevent the introduction of the whole length of the instrument.

3. *Dyschezia.*—In some cases of constipation, it is found that the rectum is practically always filled with feces. Study by means of the Roentgen ray shows that there is no delay in the progress of the stool through the proximal colon. In other words, we are dealing with a condition in which that portion of the gut charged with the actual act of defecation fails to function. The pathogenesis of this disorder, known as dyschezia, has been described by Hurst as follows: "The habitual neglect of the call to defecation leads to the accumulation of the feces in the rectum and pelvic colon which gradually become more and more distended. The distention diminishes the tone and impairs the contractility of the musculature; as the force required to empty the rectum when over-distended with feces is much greater than that required to empty it under normal conditions, the weakened muscular coat is incompetent to do its work, and, even if a greater effort be made, the evacuation remains incomplete. In time, the muscu-

lature of the pelvic colon and rectum may become so profoundly atonic and paretic that it can never be restored to its normal condition." Dyschezia may also develop secondarily to any condition which causes pain during defecation, such as inflamed or thrombosed hemorrhoids, anal ulcers or fissures, and pelvic peritonitis. In women, the condition is frequently caused or aggravated by childbirth.

4. *Constipation with Redundant Colon.*—This will be discussed in the section on the redundant colon.

5. *Constipation with Mucous Colitis.*—This will be discussed in the section on the irritable colon.

Diagnosis of Constipation

The diagnosis of constipation may be made from the history, the physical examination, stool inspection, and Roentgen examination.

The history is usually straightforward. The patient complains that he has less than one stool daily, or that the feces are hard and the total output small. Occasionally, however, the story is misleading in that, despite a daily movement, the actual output may still be insufficient to empty the colon adequately, according to the best objective standards. Such cases may be designated "masked constipation."

Physical examination is performed by abdominal palpation and by rectal touch. By the former method, a contracted or knotted and usually tender iliac colon may be rolled over the left iliac fossa in cases of spastic constipation. In dyschezia, a rectum filled with hard scyballa may be discovered by the gloved finger. If the sphincter ani is very painful, the rectal packing may be determined in women by vaginal investigation.

Stool inspection reveals at once any departure from a normal bowel movement. Unfortunately, the criteria of a normal bowel movement do not appear to be as well

known as they should be. The amount of stool evacuated daily should represent a fecal column reaching from about the mid-descending colon to the rectum. This column is generally broken up into segments of the size and consistency of frankfurter sausages. A stool of normal formation contains about 75 per cent water. There is no mucus, blood, or pus. In constipation, the amount of feces expelled daily is small, the form is lumpy, the consistency hard. Fresh blood is occasionally present from bleeding fissures or piles. Mucus may also be noted.

Roentgen examination gives the most comprehensive evidence as to the presence of constipation, and the existing variety. The ideal procedure is to administer an opaque meal and see what happens to it. No cathartics or enemas should be permitted during the course of the examination unless a rectal impaction appears imminent. Observations should be made daily with the X-rays until the barium is completely and spontaneously evacuated from the rectum. Under normal conditions, the colon is empty at 48 hours, or between that observation and the next at 72 hours. In order to complete the study by observing the exact course and extent of the colon, an opaque enema is administered.

Treatment of Constipation

Owing to lack of space, only the chief principles of therapy will be presented in schematic form as follows:

1. Prophylaxis should provide for regular food intake, for routine visits to the toilet, sufficient water drinking, especially on arising, and a balanced dietary containing sufficient roughage.

2. Visceroptosis and malnutrition should receive appropriate attention. Abdominal support and a fattening diet are indicated. For the latter, butter and olive oil are particularly to be recommended.

3. The psychic and nervous causes of constipation should be controlled as much as possible by appropriate

mental and emotional hygiene, by adequate vacations, rest, and sufficient sleep, and by sedative medication. Small doses of chloral and bromide may be effectively prescribed over long periods of time.

4. Vicious bowel habits should be broken up by the immediate and complete withdrawal of cathartics and enemas. The period of waiting for the resumption of spontaneous bowel movements is often a most trying one for physician and patient. It is always best to combine the withdrawal treatment with a Roentgen study, especially for psychological reasons.

5. Atonic constipation should be treated by careful, not abrupt stimulation, with gradually increasing amounts of roughage added to a basically smooth diet. Agar and psyllium seeds are of value.

6. Spastic constipation should be treated by rest, sedatives, lubricants, and antispasmodics. The oils may be administered by mouth or by rectum. For rectal use, a small hand syringe works admirably. In cases of spasm limited to the lowermost colon, a course of local applications of magnesium sulfate through the proctoscope, as advocated by Soper, is beneficial.

7. Dyschezia should be treated by local measures directed systematically to the rectum. Local lesions should receive appropriate attention. Otherwise, small water injections, retention oil enemas, or suppositories are indicated. In some cases, a course of rectal dilatations, as with Wales bougies, may be helpful.

8. Cathartics have no place in the routine treatment of constipation. Being habit forming drugs, they increase the evil instead of relieving it. Their use should be reserved to special occasions where purgation is deemed advisable, as well as to the care of the very aged and of those suffering from certain chronic diseases. Cathartics may also be of use temporarily, in the case of patients who are bed-ridden from any cause. The mildest drug

in the smallest effective dose is the rule for all such medication.

9. Irrigations likewise do not cure constipation. If they are deemed of value for some ulterior purpose, it must be borne in mind that they accomplish their end at the expense of normal colon function.

Common Anomalies of the Colon

Clinical Significance of Anomalies.—Anomalies of the colon are a distinctive expression of organic constitutional inferiority of the digestive tract. They are of importance clinically because they are frequently encountered, and because they represent points of weakness in the large intestine which predispose their bearers to colonic malfunction. Congenital anomalies may cause symptoms in all their owners some of the time, in some of their owners all of the time, but are under no obligation to cause symptoms in all of their owners all of the time. In other words, although the colonic malformation may not become manifest under ordinary favorable conditions of existence, it does attract attention as soon as the subject is exposed to physical or emotional strain, to wasting disease, or to trauma such as surgical operation or childbirth. In general, the tendency is for the organism as a whole to compensate for the presence of a congenital deformity; and it is only when this mechanism breaks down that symptoms arise. This explains the late onset of complaints in many cases. The most common exciting causes of bowel decompensation have just been mentioned. Underlying contributing causes are improper diet, bad hygiene, and viscious bowel habit formation.

The Redundant Colon

The most common congenital anomaly of the large intestine is the redundant colon. It was encountered in almost 19 per cent of a series of over a thousand patients (1927 figures). The redundant colon occurs more often in men and in the sthenic habitus. It is, as the name implies, a condition of congenitally increased colonic length. The

redundancy may take the form of simple pleats or reduplications or of extensive loops and twists. A simpler form is that of kink or angulation. The most frequent site is the pelvic colon. The condition may be familial or hereditary. (Figs. 3 and 4.)

FIGURE 3

Symptoms.—The symptoms associated with redundant colon are constipation, pain, and gas distress. The acute discomforts are generally ascribed to the development of spasm from irritation at the site of the redundancy. In this connection, one should be careful to avoid thinking of a kink or loop as a fixed or static barrier, such as volvulus or stricture. It is true that a loop may become

partially twisted by overloading with gas or feces, but the resulting symptoms of relative obstruction persist only as long as the original factors obtain; and those are usually transient. In other words, we are dealing with neither an organic nor a functional condition, pure and simple,

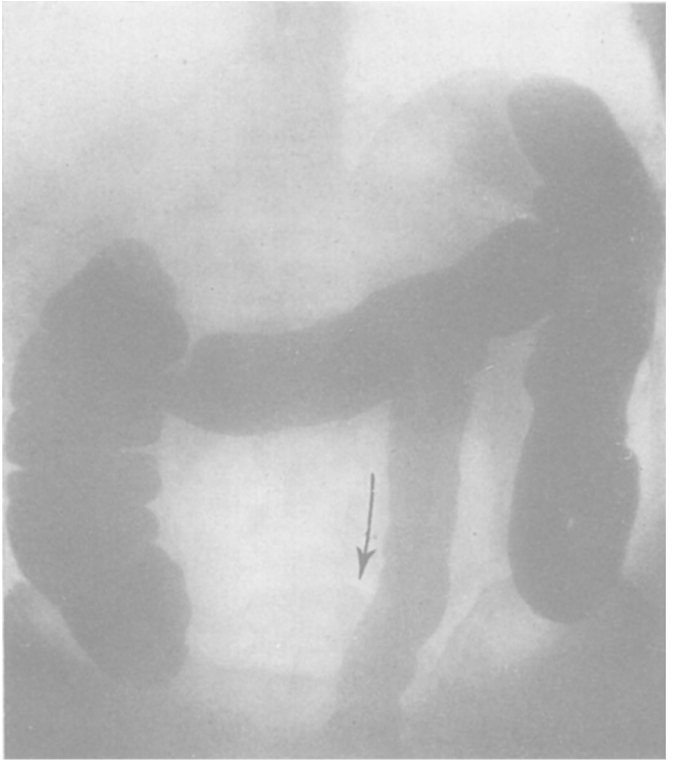

FIGURE 4

but rather with a combination of both that seems to be characteristic of congenital malformations of the digestive tract in general.

The constipation of colonic redundancy often dates back to childhood. The interval between spontaneous bowel movements may extend from three days to a week or more.

There is often discomfort in the lower right quadrant, characterized as dull, dragging, or sticking in nature, and increased by bodily exertion. Not infrequently there is gas pressure, fullness or pain referred to the exact location of the redundant loop in the left colon. Sometimes precordial distress or increased belching is provoked by gas accumulation under the left diaphragm. The passage of flatus is at times difficult, but when it does take place, is often followed by complete relief of symptoms.

Diagnosis.—The diagnosis of colonic redundancy by physical examination of the abdomen is practically impossible. Similarly, rectal palpation reveals no fecal accumulation, for the delay is invariably above the pelvi-rectal flexure. It is only by careful Roentgen study, both by barium meal and by opaque enema that the existence and the extent of the anomaly can be accurately determined. The enema reveals the exact site and form of the redundancy; the opaque meal shows what it does to give the patient symptoms.

Treatment.—The first step in the treatment of redundant colon (after an accurate estimate of the situation by the methods just mentioned) is the restoration of colonic function. This is all the more important because patients often suffer more from their own ill-advised interference than they do from the underlying condition. The withdrawal of irritating cathartics should be immediate and complete. They serve only to increase the colonic irritability and decompensation. As a matter of fact, enemata may be quite ineffectual in this condition, either because they fail to reach the affected bowel segment, or because, once administered, they become more or less completely "lost" in the long, tortuous, and atonic colon. In some of my cases, 80 to 90 ounces were required to reach the cecum, the normal colonic capacity being 38 ounces. Violent purges are actually dangerous, as, in my opinion, they may produce volvulus, a condition that can only occur in a redundant colon.

Once artificial aids to bowel movement are eliminated—and this may involve considerable tact as well as firmness in the case of some individuals—it is only a question of a few days before the colon builds up enough reserve to begin producing spontaneous stools. These movements, small at first, tend steadily to gain in bulk as time goes on. The further management of the condition does not differ essentially from the general treatment of constipation as already outlined. On the whole, the therapy may be described as conservative and protective. A bulky but not too rough diet is best suited to stimulate effective peristalsis, and forced water drinking is generally necessary to prevent undue drying of the feces.

Lubrication from above and below is very often required, and helps particularly to overcome the associated colonic spasms. It is generally necessary to continue this form of treatment for a long period of time. The patient's co-operation in keeping a careful "stool record" is a real contribution toward a successful outcome. Belladonna in increasing doses is useful when the spastic tendency is excessive.

Although it is not absolutely essential for the bowels to move daily, and a total of 5 or 6 stools a week may be compatible with a very fair degree of comfort, it is well to be on the lookout for gradually accumulating fecal retentions. To overcome these, an occasional thorough but non-irritating colonic irrigation, or else a single dose (1½ ounces) of castor oil may be all that is needed. Only if the above measures fail is a compromise with the cathartic habit justifiable. None but the mildest laxatives should be selected, such as cascara or phenolphthalein; and these should be given, as always, in the smallest dose compatible with satisfactory action.

Surgical intervention is to be reserved for cases of volvulus only.

The Low Cecum

Almost as common as the redundant colon is the anomaly known as the low cecum. It occurred in almost 18

per cent (revised figures) of my cases. This condition is the result of over- or hyper-descent of the cecum during the intra-uterine development of the colon. Normally, the cecum is unattached, whereas the ascending colon is fixed to the posterior abdominal wall. When the ascending colon is provided with a mesentery, the mobility of the cecum is correspondingly magnified. The resulting condition has been described as "cecum mobile." On the other hand, when the normal fixation of the ascending colon is continued downward, the cecum becomes fixed in its turn to the posterior abdominal wall. If, in addition, there is hyperdescent, we may speak of a "low, fixed cecum."

Symptoms—The low cecum occurs most often in women and in individuals of the asthenic habitus. The symptoms associated with this condition are either systemic, being strikingly those of so-called autointoxication—namely, nausea, vomiting, and headache; or else they are local, giving rise to pain or discomfort in the right lower quadrant. As with other congenital anomalies, the symptoms may be absent, the patient being merely predisposed to these special forms of malfunction.

The tendency to vomit is a striking characteristic of patients with low ceca. Such individuals seem to constitute the "easy vomiters" of ordinary experience. Some of them have frequent vomiting bouts from relatively slight causes, such as dietary indiscretion or emotional stress. Others have more severe attacks with sick headaches, so-called bilious attacks. In women, these occur more often during the menses. Many patients suffer from trainsickness and carsickness. The cause of vomiting and headaches is not quite clear. It may be due to a drag of the entire right colon across some part of the duodenum, causing a temporary block with transient duodenal stasis.

The right-sided abdominal pain occurs in about one-half of the patients with low ceca. It is either dull, dragging in nature and constant in occurrence, or else it comes in attacks of colic, sometimes (though by no means always) associated with vomiting. Although tenderness over the

distended and gurgling cecum is commonly present, rigidity and fever do not enter into the clinical picture. Despite this, the diagnosis of "chronic appendicitis" has been freely made in this condition. Indeed, over one-fifth of my series of patients with low ceca have had an appendectomy without (except in the rarest of cases) experiencing any permanent relief of symptoms.

Diagnosis.—The diagnosis of low cecum is best made by Roentgen observation nine hours after a barium (opaque) meal. An opaque enema is less satisfactory in revealing this condition. (Figs. 5 and 6.)

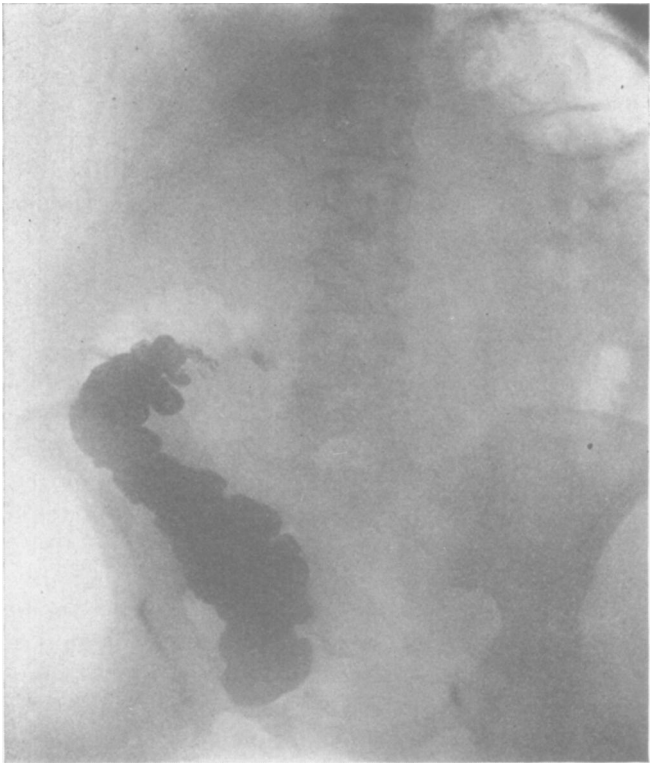

FIGURE 5

Treatment—The treatment of patients with low cecum should embrace the following items and considerations:

1. Rest—physical, nervous, and mental.

2. Fattening cure with abdominal support to restore normal intra-abdominal pressure and to overcome the asso-

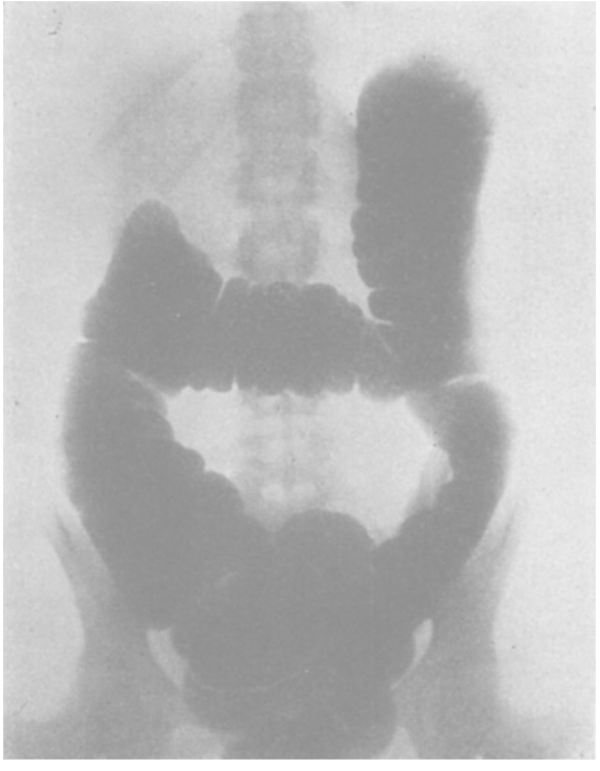

FIGURE 6

ciated ptosis. The position of the cecum, however, is not often altered by medical treatment.

3. Improvement of colon function. The idea is to clear the track ahead and prevent backing up in the proximal colon with resultant increased dragging in that region.

It should be pointed out, however, that gross stasis has not been demonstrated to occur more frequently in low than in normal ceca.

4. Antispasmodics, such as belladonna, and general sedatives, such as repeated small doses of bromid and chloral, or codein.

Surgical therapy.—Removal of the appendix is futile. More radical procedures devised to improve the position of the cecum and to fix it, if movable, though theoretically less objectionable, are perhaps unnecessary, except in rare cases of actual volvulus of the cecum.

Colonic Irritability (Simple Colitis)

Definition.—The syndrome of the "irritable colon" is an extremely useful concept. Broadly speaking, colonic irritability is characterized by instability of function in the absence of a gross colonic lesion. The condition seems often to be congenital in origin. It has also been described under the name "simple colitis," using the term much as one designates the common cold, "rhinitis." This simple functional irritability is to be distinguished from those severe forms of colonic disease, perhaps more properly called "colitis" which are always associated with definite local organic changes resulting from trauma, infection, new growth, intoxication, or parasitic infestation. Finally, it should be borne in mind that an irritable colon may at times develop into a true organic colitis, and that, on the other hand, an organic lesion is practically always accompanied by some degree of irritability.

The pathologic physiology of the irritable colon is somewhat similar to that of the irritable stomach, being characterized by:

1. Hypertonicity, *i. e.*, frequent and irregular spastic phenomena which may co-exist with more or less localized stasis. The term "spastic colitis" is sometimes used to designate this phase of colonic irritability.

2. Hypermotility, as evidenced roentgenologically, and clinically by the passage of mushy and watery stools, generally, though not necessarily with increased frequency.
3. Hypersecretion of mucus. This is generally regarded as a local protective mechanism.

The underlying causes of colonic irritability are, in order of their clinical importance:

1. Instability of the involuntary nervous system, often described as "vagotonia," "spasmophilia," "endocrine imbalance," etc.
2. Constipation and the abuse of cathartics, enemas, and irritating irrigations, particularly.
3. Organic lesions of the colon.
4. Gall-bladder disease.
5. Gastrogenous factors, such as achlorhydria, improper diet.
6. Disturbances of the small intestine, including certain rather ill-defined intestinal dyspepsias; also pancreatic insufficiency.
7. Pericolitis, due to extraintestinal irritation from adhesions, pressure, etc.
8. Remote lesions outside the digestive tract acting reflexly on the colon by way of the involuntary nervous system. Possible examples are "focal infections" in teeth, tonsils, prostate, etc.

Symptoms.—The symptoms of colonic irritability are among the most common encountered in clinical gastroenterology. To begin with, patients suffering from this disorder are frequently aware of their intestinal activities. They have been aptly described as being almost constantly "belly-conscious." Abdominal distress and restlessness, flatulence and distention, gas pains and minor colics, tenesmus, fits of diarrhea with or without preceding constipation, are all familiar manifestations of this condition.

Varieties.—Naturally, there are all degrees and many varieties of colonic irritability. Perhaps the mildest form is that encountered in hypersthenic individuals. Here, a heightened colonic tone is so much the rule that it may be regarded as a condition of normality. Thus, such an individual, even in perfect health, may pass two or three semiformed or even mushy stools daily, usually one after each meal. As time goes on, these patients seem particularly

likely to develop diverticulosis, a condition which is oft-times closely associated with increasing constipation of the spastic variety. It is in these cases, too, that the opaque enema frequently reveals the condition that has been described as "fibrillation." Infection of the diverticula (diverticulitis) may also occur, though this happens relatively seldom in proportion to the total number of cases revealed by Roentgen studies.

Another special and common form of irritable colon is often called mucous colitis (colica mucosa, myxoneurosis coli). This disease is usually associated with a high degree of autonomic instability. In this disorder, mucus is produced in excess; and when inspissation occurs, shreds or casts are expelled, often with painful colics. Patients sometimes mistake these casts for tapeworms. Occasionally, the presence of mucus in the stool is not noticed by the patient; and this symptom can only be elicited by careful questioning on the part of the physician. It is well to remember that mucous colitis is almost always associated with constipation, or at least with incomplete bowel evacuation.

Diagnosis.—On physical examination, the patient usually shows tenderness over the various parts of the colon, and very often over the entire abdomen. Localized tenderness in the right iliac fossa or right hypochondrium is not uncommon, and is very misleading. The diagnosis of "chronic appendicitis" is very often made in simple colitis.

Proctosigmoidoscopic examination is always useful. In the majority of cases, especially when the distal colon is involved, the direct inspection of the mucosa of the rectum and sigmoid clinches the diagnosis. Usually free mucus is seen lying in the gut. The appearance of the mucous membrane depends on the stage of the disease, and on the segment of the colon involved in the pathologic process. The changes are most marked when the distal colon is primarily affected. In early and mild (functional) cases, we find merely congestion of the mucosa. In the more severe and advanced (organic) cases which we are not now

considering, the lesions range from small punctate petechiae and ulcerations to atrophy of the mucous membrane with large or small ulcers, or to the well-known polypoid appearance. Occasionally, spasm is so marked that the introduction and passage of the instrument becomes quite difficult, the patient complaining of an undue amount of pain.

Test meal.—Examination of the gastric contents may prove to be helpful, inasmuch as an achylia or marked hypochlorhydria, when present, is generally related to the associated colitis.

Feces.—The stool examination is of utmost importance. The elaborate laboratory procedures described in the literature, although of value in the hands of specialists, may serve to discourage the more general recourse to this valuable aid in diagnosis. In the overwhelming majority of cases, a mere glance at the stool is sufficient for all practical purposes; yet it is just this simple inspection that is so often neglected. Given a stool which is mushy in appearance, contains an excess of mucus, gives evidence of fermentation by the presence of numerous small gas bubbles on the bottom and sides of the jar, is strongly acid in reaction, has a penetrating sour odor, and the rest of the examination is either superfluous or merely confirmatory. Almost always, gross mucus is present.

The form and consistency of the stool also varies with the part of the colon involved in the pathologic process. The feces may be formed or semi-solid, though in the majority of cases, there is an increase in the water content of the stool. The color depends ordinarily on the food ingested.

The microscopic findings vary in the different types of colitis. There is always an excess of mucus. With deficient gastric or pancreatic digestion, there is always an abundance of meat fibers with or without striations. In fermentative dyspepsia, we often find incompletely digested starch granules or fungi which stain black with

iodin. For more detailed methods of examination, reference may be had to books and articles on this subject. It should be added, however, that the patient should always be placed on a standard intestinal diet (Schmidt) for at least three days preceding the examination of a stool, whenever the findings are at all doubtful.

Roentgen diagnosis.—This is perhaps the most useful single method for the diagnosis of colitis. It will be recalled that the filling and emptying of the colon take place according to a definite time table. Normally, the cecum begins to fill four hours after the standard opaque meal. At six hours, the head of the barium column reaches the region of the hepatic flexure; the tail is still in the ileum. At nine hours, the head reaches the splenic flexure, and the tail has cleared the terminal small intestine. At twenty-four hours, the bowels have moved once; and the left-sided shift has occurred—that is, the barium has cleared the proximal colon in whole or in part, and has become distributed throughout the distal colon. By forty-eight hours, the bowels have moved twice, and the colon is clear except for traces of the barium.

Any departure from the above schedule is abnormal. If the change is in the direction of stasis, a diagnosis of some variety of constipation is in order. When, on the other hand, the colonic transit is hastened, if only in part, there exists a state of irritability which is the essential motor expression of colitis. Colitis may, therefore, be diagnosed, or at least suspected, from the following Roentgen findings:

1. At the "six hour observation," the head of the column is beyond the splenic flexure.

2. At the "nine hour observation," the head of the column is in the pelvic colon or rectum, with or without the passage of a stool containing barium. (Figs 7 and 8.)

3. At the "twenty-four hour observation," the colon is empty.

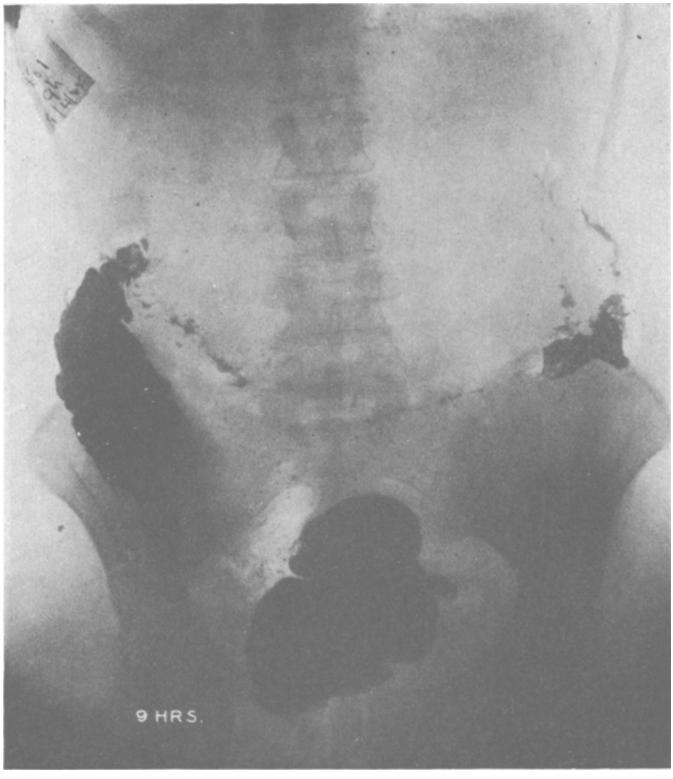

FIGURE 7

In addition to the abnormalities of function, there are interesting changes in colonic form as revealed by a consideration of the sacculi or haustrations. Normally, these are deep-cutting, evenly spaced, and evenly balanced—that is, the lumen is central, and the haustra on either side are equal in size, and symmetrical. In colitis, there is either irregularity or complete absence of the haustrations, lending an atypical beaded, mottled, or smooth appearance to the fecal column, as the case may be.

Similarly suggestive is a scattered filling of the colon, or actual filling defect, provided, of course, that obstruc-

FIGURE 8

tive new-growth is excluded. Increased gas content of the large intestine is likewise suggestive of colitis.

Prognosis.—The outlook for the absolute cure of colitis is often so uncertain that the prognosis must be guarded. However, it is equally true that some patients can be cured, and many, if not most, can be relieved of their symptoms. In every case, nevertheless, the treatment must be exceedingly painstaking and long-continued, as the underlying autonomic instability is a difficult, if not an impossible matter to eradicate. Many cases still go unrecognized, and are, therefore, either improperly or insufficiently treated.

General Principles of Prophylaxis and Treatment

Before beginning any active interference, a complete and careful survey is indispensable. Perhaps the first step in therapy is the absolute withdrawal of all forms of colonic abuse (cathartics, enemas, irrigations) so frequently indulged in by these patients.

In general, it may be said that the prophylaxis and treatment of colonic irritability are dominated by the neurotic nature of this affliction. Every effort should be made to preserve or restore autonomic stability. To this end, the special hygienic problems of each case must be ascertained, and a sensible program outlined with particular emphasis on work, sleep, rest, and recreation. The emotional life of the patient should be controlled as much as possible, since many attacks of colitis are distinctly associated with psychic trauma. In all cases, rest is important; and complete bed rest may well be prescribed for all debilitated subjects. Exposure to cold and wet is distinctly harmful, and must be avoided. Excess of roughage must be eliminated from the diet, and iced foods and drinks should be used, if at all, with great caution.

Diet.—The dietetic treatment of simple colitis is essentially conservative and protective in nature. The food should be as non-irritating as possible—hence all coarse vegetable fiber must be particularly excluded. On the other hand, to make up for this deficit and to supply enough "frame-work" for the fecal column to ensure adequate peristalsis, relatively large amounts of bland and bulky but wholly nonabsorbable salts have been found most useful. These will be described in detail later.

The bland diet for the irritable colon differs from that for gastric irritation in two particulars. Milk is to be avoided or else reduced to a minimum, as in many cases, it greatly increases gas formation and gas distress. Meat, on the other hand, is generally well tolerated, and may be given from the start in large amounts. A well-balanced diet is secured by a modification of the standard Schmidt

diet, which may be concentrated in regard to the number of feedings to three in the twenty-four hours. All cold foods and drinks are to be avoided. If the above regime should prove too constipating, the best results will be obtained from mineral oil, agar, or psyllium seeds.

As the condition improves, other articles may be added, one by one, to the diet. The stools are to be carefully watched during this process, and if they again become mushy, one must return to the feeding which last gave a normal fecal output, and try some other addition than that which proved harmful. Among the first articles to be added to the basic regime are well-cooked breast of chicken, rice, fish, and finely pureed starchy vegetables. Fermented milks or acidophilus milk are well borne by some patients. The last items to be added—and with the greatest caution—are the raw vegetables and fruits, and, in general, foods containing mechanical or chemical irritants. Indeed such articles may never be tolerated by many individuals.

Medicinal Treatment.—When the stools do not readily resume their normal form and consistency, the administration of an ounce or two of castor oil, repeated weekly if needed, helps to clear out old residues, mucus, and bacteria. In other cases, sodium phosphate or similar salts give better results, since some patients cannot stand even the mild irritating action of the ricinoleic acid. It is important that the salines be given in slightly hypertonic concentration and on an empty stomach, for, when the salts are exhibited in too concentrated form, the excessive osmosis which takes place into the gastro-intestinal lumen may actually cause cramps or even delayed action of the bowels.

The inert bulky chemicals already mentioned are of value in allaying colonic irritability. They not only supply the necessary "roughage," but aid further in mechanically removing mucus and bacteria by "adsorption." The ordinary barium sulfate used for Roentgen diagnosis is admirable for this purpose; so is the bulky diatomaceous earth

known as kaolin. When both drugs are mixed in equal proportions, a thorough suspension is assured. The dose, which is a tablespoonful of each powder twice daily, is best administered in cocoa, fermilac, cereal, applesauce, or some similar thick mixture. This form of therapy should be pushed for long periods, and only gradually discontinued.

Other drugs may be used as occasion demands. The general sedatives (chloral and bromids together in small doses) are always useful to depress autonomic instability. If there is much pain, codein may be ordered, though this is seldom necessary. For overcoming spasm, atropin or belladonna in increasing doses is very helpful, and is probably the best drug for routine use. One may begin with as much as ten or fifteen drops of the tincture three times a day, and raise the dose one drop daily till the symptoms disappear, or the ocular accommodation is paralyzed. When gastric anacidity exists, dilute hydrochloric acid is indicated, the dose being five to twenty drops in a glassful of water to be taken with meals. Conversely, if there is hyperacidity, a neutral antacid such as tribasic magnesium phosphate may be employed when constipation predominates, or the calcium salt when the bowels are loose. The dose of each is one teaspoonful or more, thrice daily.

In many cases, heliotherapy or the artificial actinotherapy seems helpful. The latter is supplied by gradually increasing exposure to the ultraviolet rays. Other patients respond favorably to the application of the abdominal compress. Very probably diathermy is of value in some cases.

Diverticulosis and Diverticulitis

Most cases of diverticulosis are discovered at X-ray examination or at autopsy, and cause no symptoms. Trouble only arises when the contents of the sacs become so inspissated as to cause perforation, or when the sacculi themselves become infected. Both these complications lead to perisigmoiditis in its acute or chronic varieties. The prophylaxis of diverticulitis consists in the treatment of

the underlying spastic constipation, with special attention to adequate lubrication. Mild cases are treated the same as simple colitis, with even more emphasis on the use of barium or barium and kaolin mixture in large doses. These powders fill the saccules with inert matter, thus replacing the harmful putrefactive or infected contents. In recurrent cases, the barium treatment must be continued indefinitely.

In the presence of infection and even of small perforations, a conservative, expectant therapy is justifiable, inasmuch as the escape of distal colon contents is less dangerous to the peritoneum than is that of the more fluid and virulent material present in the large intestine. In the face of these complications, complete bed rest, the application of an ice bag or coil, and the administration of sedatives is often effective. Should, however, the clinical symptoms point to progressive peritoneal involvement or to actual abscess formation, prompt operative relief is, of course, indicated. In all doubtful or borderline cases, a surgeon should be called early in consultation.

Mucous Colitis.—The treatment of mucous colitis involves:

1. Control of the underlying constipation.
2. Control of mucus accumulation.
3. Control of the colic.
4. Improvement of the nervous and general health.

1. The underlying constipation is to be controlled by the measures already outlined. If spasticity is marked, or if the colon is very sensitive to irritants, it is well to avoid the use of rough foods. Indeed, these may be more harmful under such circumstances than mild tonic laxatives, such as cascara, agar or phenolphthalein agar. Otherwise, the general rule is that the diet should be built up as quickly as possible, so that colonic tolerance to the ordinary food irritants should be increased rather than

diminished. In general, the oils are well borne in mucous colitis, both when given by mouth and by rectum. Overnight instillations of warm olive oil, cotton seed or corn oil are particularly beneficial, not only for the constipation, but for the removal of the mucus as well.

2. To overcome the accumulations of mucus, a weekly purge of castor oil or of calomel is recommended. Colon irrigations are occasionally of benefit. At first, the irrigations may be given daily or every other day for one or two weeks; then twice a week for several more weeks; and, finally, once a week until the mucus is eliminated. Before the irrigation proper, a cleansing enema should be given to remove whatever fecal accumulation may be present. Plain hot water, saline solution, or lime water in amounts ranging from twelve to twenty-four quarts may be employed for the irrigation. When spasticity is prominent, local intraintestinal applications of magnesium sulfate are very well worth trying. Transduodenal lavage with a hypertonic saline solution, as recommended by Jutte, may give relief in some cases.

3. The treatment of the attacks of colic necessitates active sedative and relaxing measures. Rest in bed; bromid by mouth; atropin and codein by hypodermic injection; all in full physiologic doses, together with hot applications to the abdomen in the form of hot water bag, electric pad, poultice or stupe, or even a hot bath, are among the most useful measures. In addition, the mucus accumulation must be removed, whether by castor oil by mouth, or by colonic irrigations, or by the administration of oil enemata.

For measures directed toward the improvement of the nervous and general health, the reader is referred elsewhere. Inasmuch as increased fatiguability is a characteristic of patients suffering from mucous colitis, it is essential that they should get plenty of rest and sleep, and that they should avoid strains and excitement of all sorts, mental, physical, and emotional.

SUMMARY

1. The most common disorders of the colon as encountered in private practice are constipation, the common anomalies, and simple colitis.

2. The most important etiologic factors are the presence of congenital malformation, autonomic nervous instability, and vicious habit formation.

3. Roentgen-ray studies give the most comprehensive information as to the presence and extent of these disorders.

4. Congenital anomalies are more common than is generally appreciated. They act as potential points of irritation, but ordinarily produce symptoms only when the compensatory mechanism of the colon is considerably impaired, if not entirely disrupted.

5. The general aim of treatment is the restoration of colonic function. To this end, gentle and conservative measures are most effective. Aggressive interference, such as with irritating cathartics and irrigations, tends only to aggravate colonic malfunction.

LEGENDS

Fig. 1. Normal colon in asthenic individual. Opaque enema. Normal amount required to fill colon is 38 oz. Note the relatively straight course and the "postural tone," the distal colon being normally narrower than the proximal.

Fig. 2. Atonic colon. Opaque enema, 79 oz. required to fill. Note loss of tone throughout distal colon with relative dilatation. Contrast with Fig. 1.

Fig. 3. Redundant colon. Appearance 24 hours after barium meal. Note gas caught in distal loop.

Fig. 4. Redundant colon. Opaque enema. Note double splenic flexure and long straight efferent loop (arrow).

Fig. 5. Low cecum. Appearance 9 hours after barium meal.

Fig. 6. Low cecum. Opaque enema.

Fig. 7. Simple colitis. Appearance 9 hours after barium meal. Note "streaking" through transverse colon and early packing in rectum.

Fig. 8. Simple colitis ("Spastic colitis"). Appearance 9 hours after barium meal. Note increasing spasticity and breaking-up of the fecal column in its rapid passage to the rectum.